



# **Armed Forces College of Medicine AFCM**



# **Pharynx And Esophagus**

**By Professor Dr. Shahira Youssef**

# INTENDED LEARNING OBJECTIVES (ILO)



By the end of this lecture the student will be able to:

1. Identify extent & parts of pharynx
2. Recognize features of nasopharynx, oropharynx, & laryngopharynx
3. Identify Waldeyer's ring & its importance
4. Describe relations , blood supply, lymphatic drainage of palatine tonsils
5. Describe the arrangement , nerve supply & action of muscles of pharynx
6. Recognize beginning , course and termination of esophagus
7. Identify constrictions of esophagus

# Lecture Plane



Definition of pharynx

Extent

Parts

Features

Layers

Muscles

Nerve supply

Blood supply

# Pharynx



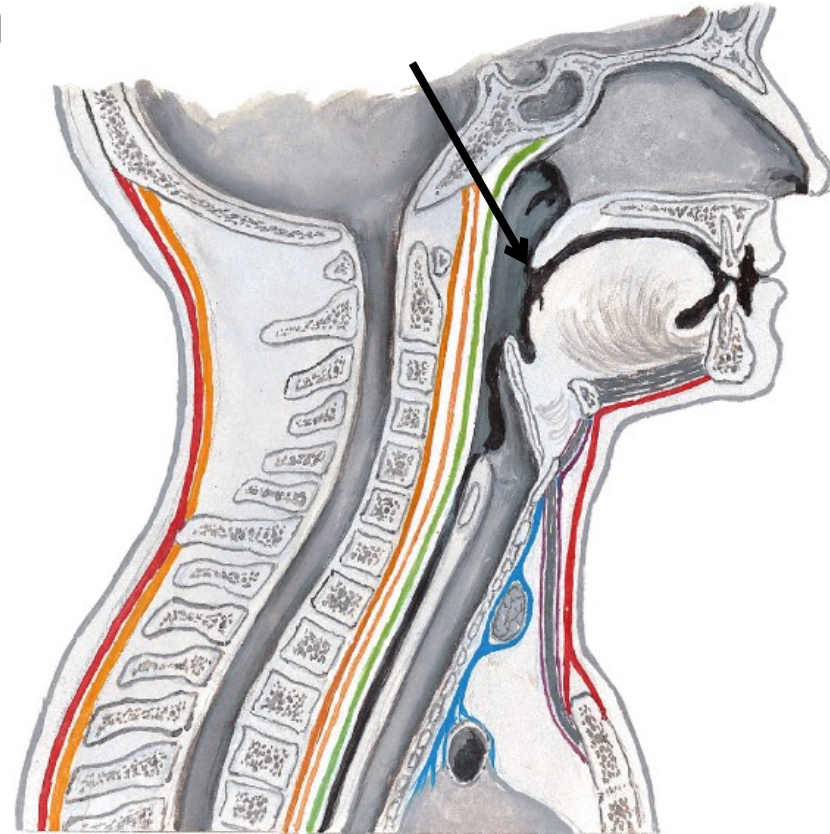
A muscular tube extending from the **base of skull** to the lower border of **cricoid cartilage** (6 cervical vert.)

It lacks the presence of anterior wall

Length : 5 inches

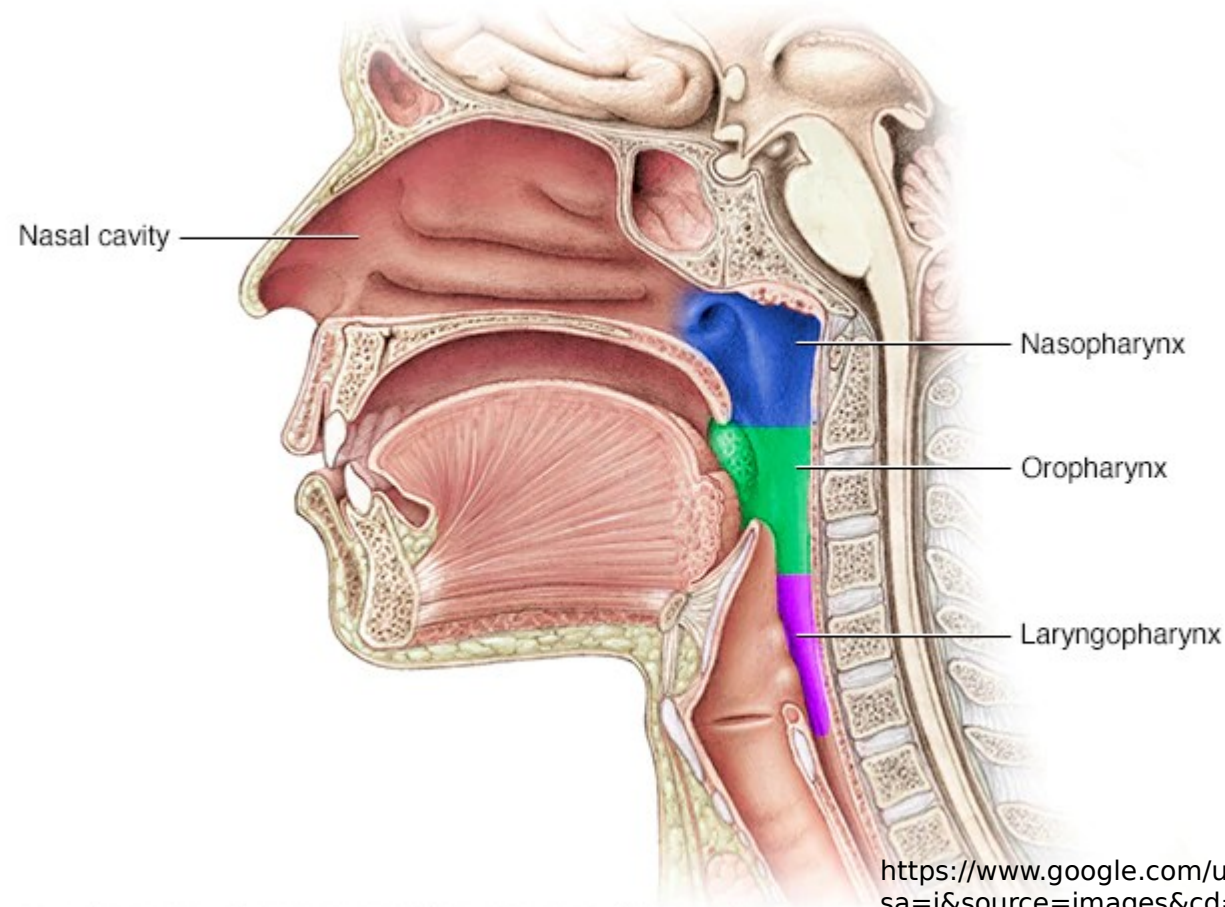
## Relations

- Ant: nose , oral cavity & larynx
- Posterior : vertebral column
- Lateral : common carotid , internal & external carotid
- Superior: base of skull



<https://www.google.com/imgres?imgurl=https%3A%2F%2Fslideplayer.com%2Fslide%2F11851879%2F66%2Fimages%2F18%2FBuccopharyngeal%2Bfascia.jpg&imgrefurl=https%3A%2F%2Fslideplayer.com%2Fslide%2F11851879%2F&docid=Hjj1ehFzka5qnM&tbnid=DcgZSXBB78KKAM%3A&vet=10ahUKEwil4-6vqf7IAhVRPBoKHWIoAwwQMwhoKA4wDg..i&w=1024&h=768&bih=689&biw=1280&q=fascia%20of%20neck%20sagittal&ved=0ahUKEwil4-6vqf7IAhVRPBoKHWIoAwwQMwhoKA4wDg&iact=mr&uact=8>

# Divisions of pharynx



© MAYO FOUNDATION FOR MEDICAL EDUCATION AND RESEARCH. ALL RIGHTS RESERVED.

<https://www.google.com/url?sa=i&source=images&cd=&ved=2ahUKEwjbsM7yqP7IAhUGmBQKHTsSAyEQjRx6BAgBEAQ&url=https%3A%2F%2Fwww.mayoclinic.org%2Fparts-of-the-throat-pharynx%2Fimg-20005644&psig=AOvVaw3SRGjtXtkfGzH9psWR9NpS&ust=1574529198394148>

**Pharynx is divided into**  
**1) Nasopharynx,**  
**2) Oropharynx**  
**3) Laryngopharynx**

# Nasopharynx



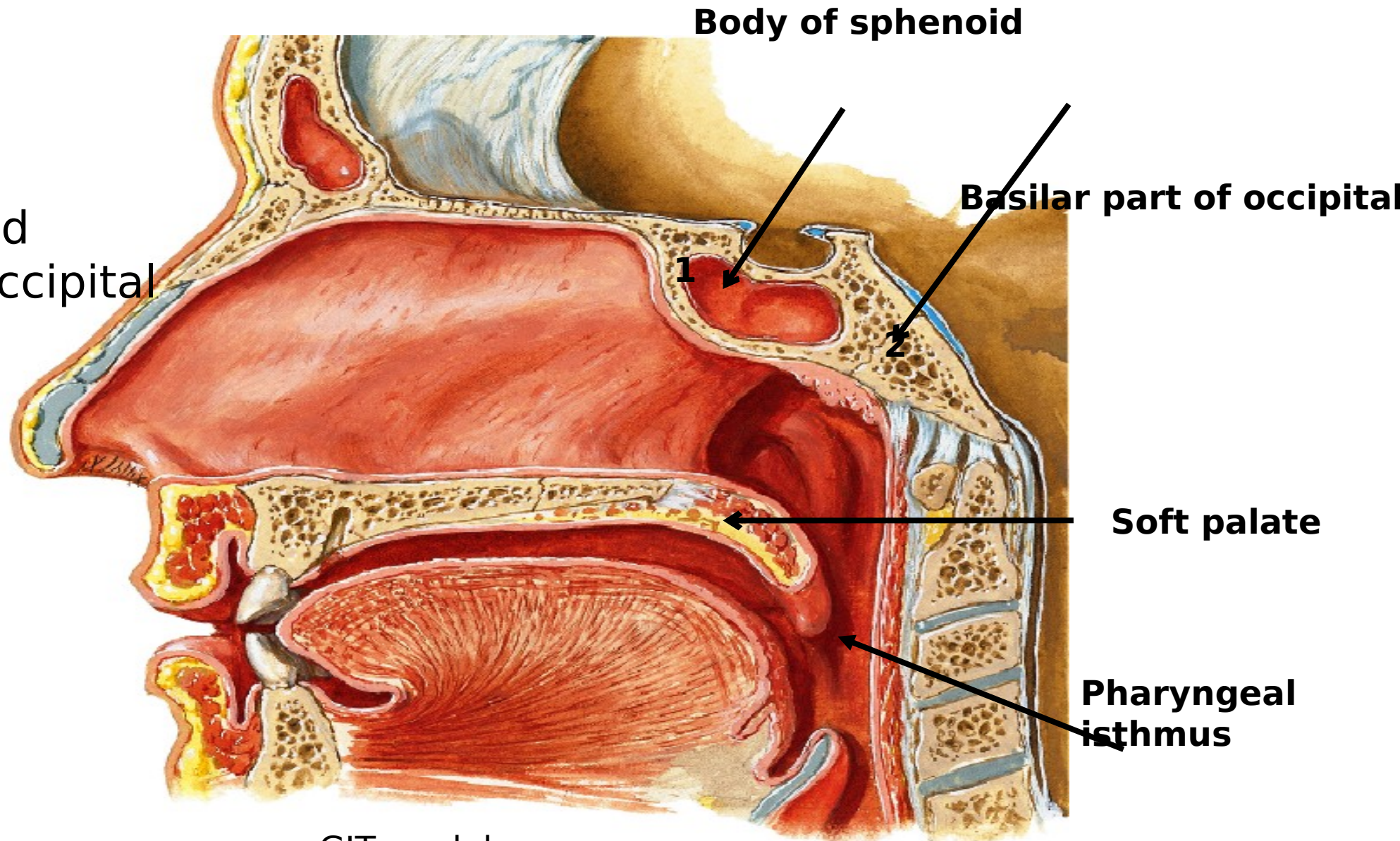
- ❑ **It lies behind nasal cavities**
- ❑ **Roof:** Body of sphenoid and basilar part of occipital bone
- ❑ **Floor** :Soft palate
- ❑ It communicates anteriorly with nasal cavity.
- ❑ It communicates inferiorly with oropharynx through **pharyngeal isthmus which lies between posterior wall of pharynx and soft palate**



# Nasopharynx



- Base of skull**
- ☐ Body of sphenoid
  - ☐ basilar part of occipital bone





# Features of Nasopharynx



- ❑ **Pharyngeal tonsils:** aggregations of lymphoid tissue at roof , atrophies with age if enlarged it is called adenoids it obstructs posterior nasal openings& causes oral breathing & over crowding of teeth
- ❑ **Opening of auditory tube:** in lateral wall
- ❑ **Tubal elevation:** formed by posterior margin of auditory tube
- ❑ **Salpingopharyngeal fold :** extends from the tubal elevation containing salpingopharyngeal muscle
- ❑ **Pharyngeal recess:** behind the

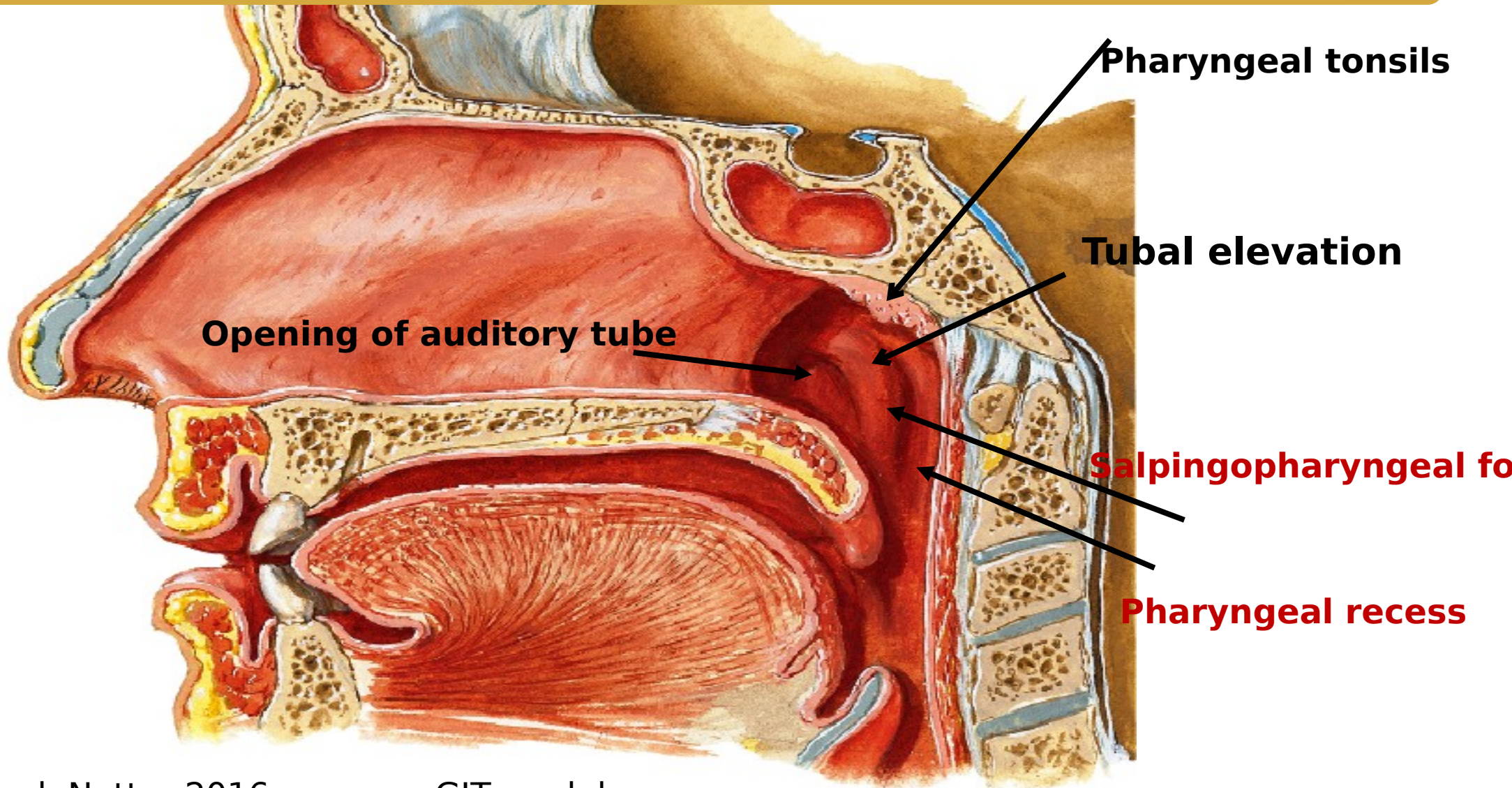
# Features of Nasopharynx



Which feature is present in roof of naspharynx

- A- pharyngeal tonsil
- B- opening of auditory tube
- C- tubal elevation
- D- tubal tonsil
- E- soft palate

# Nasopharynx



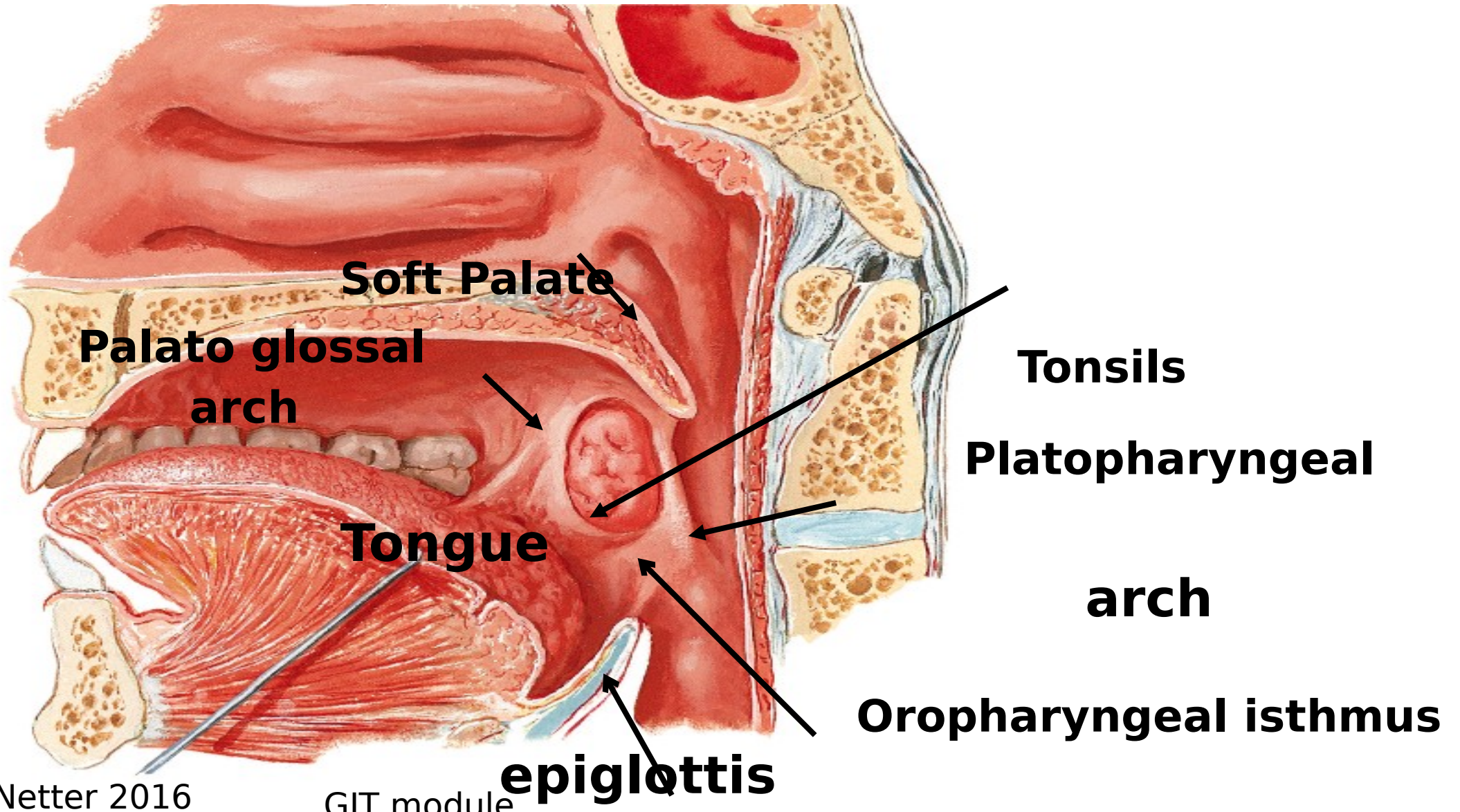
# Oropharynx



- ❑ **Lies behind oral cavity**
- ❑ **Roof:** soft palate
- ❑ **Floor:** posterior part of tongue
- ❑ **Anterior wall:** absent it communicates with oral cavity via **oropharyngeal isthmus**
- ❑ **Posterior wall:** 2&3 cervical vertebrae
- ❑ **Lateral wall:** it shows palatoglossal and palatopharyngeal arches with palatine tonsils in between



# Oropharynx





# Tonsils



**Lymphoid tissue in lateral wall of oropharynx oval in shape**

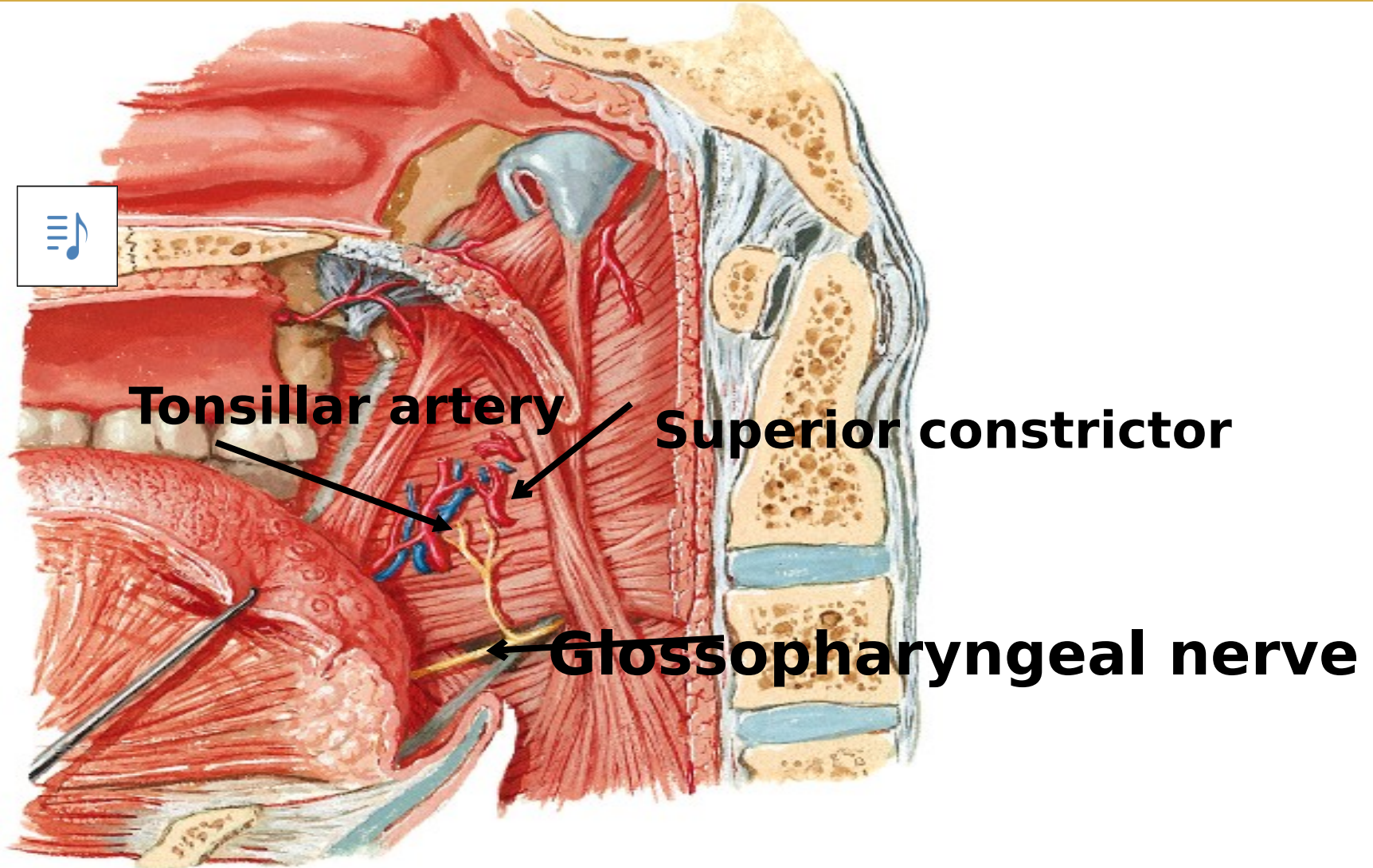
- **Anterior border** : related to palatoglossal arch
- **Posterior border:** related to palatopharyngeal arch
- **Lateral surface:** has capsule & resting on tonsillar bed
- **Medial surface** : free surface which shows tonsillar crypts



## Tonsillar bed:

- ☐ Superior constrictor muscle
- ☐ Styloglossus
- ☐ Tonsillar artery & ascending palatine branches of facial artery
- ☐ Glossopharyngeal nerve
- ☐ Paratonsillar vein which causes bleeding after tonsillectomy

# Oropharynx



# Blood & nerve supply and lymphatic drainage of tonsils



## **Blood supply**

- **Tonsillar** artery, from facial main supply
- Dorsal Lingual artery
- Greater palatine
- Ascending palatine
- Ascending pharyngeal

## **Venous drainage** :

paratonsillar vein & pharyngeal vein & facial vein

**Lymph drainage**: juglodiagatric

**Nerve supply** : tonsillar branch of glossopharyngeal

# Waldeyer's ring



A ring that encircles the entry of digestive system & respiratory system

It is formed by

- 1-Pharyngeal tonsils superior
- 2-Palatine tonsils lateral
- 3-Lingual tonsils inferior

**Defense mechanism**



# Laryngopharynx



It extends from epiglottis to lower border of cricoid cartilage

**Anterior wall:** inlet of larynx and cricoid cartilage

**Posterior wall:** 3-6 cervical vertebrae

**Lateral wall:** it shows piriform fossa

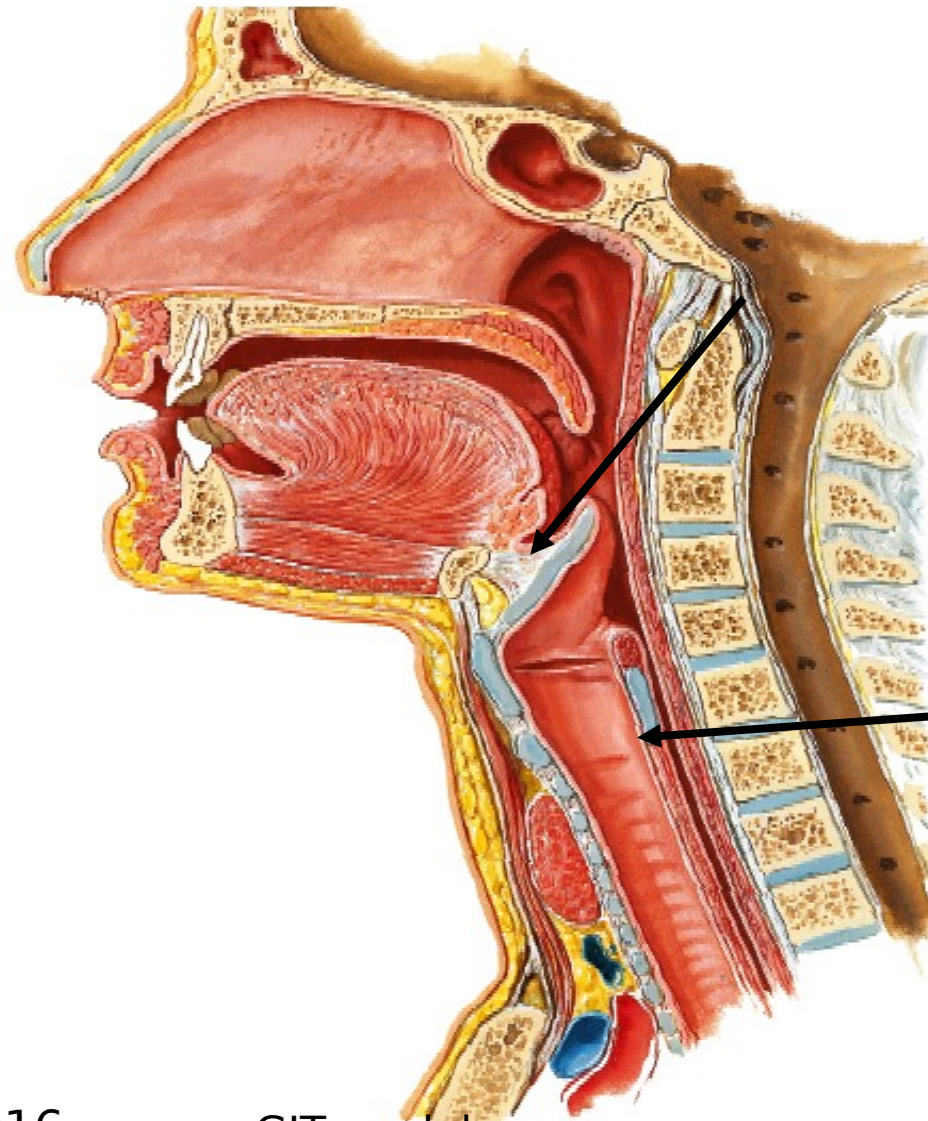
**Piriform fossa**

**Medial :** aryepiglottic fold

**Lateral :** thyrohyoid membrane

***Site of foreign body impact that causes cough due to irritation of internal laryngeal nerve***

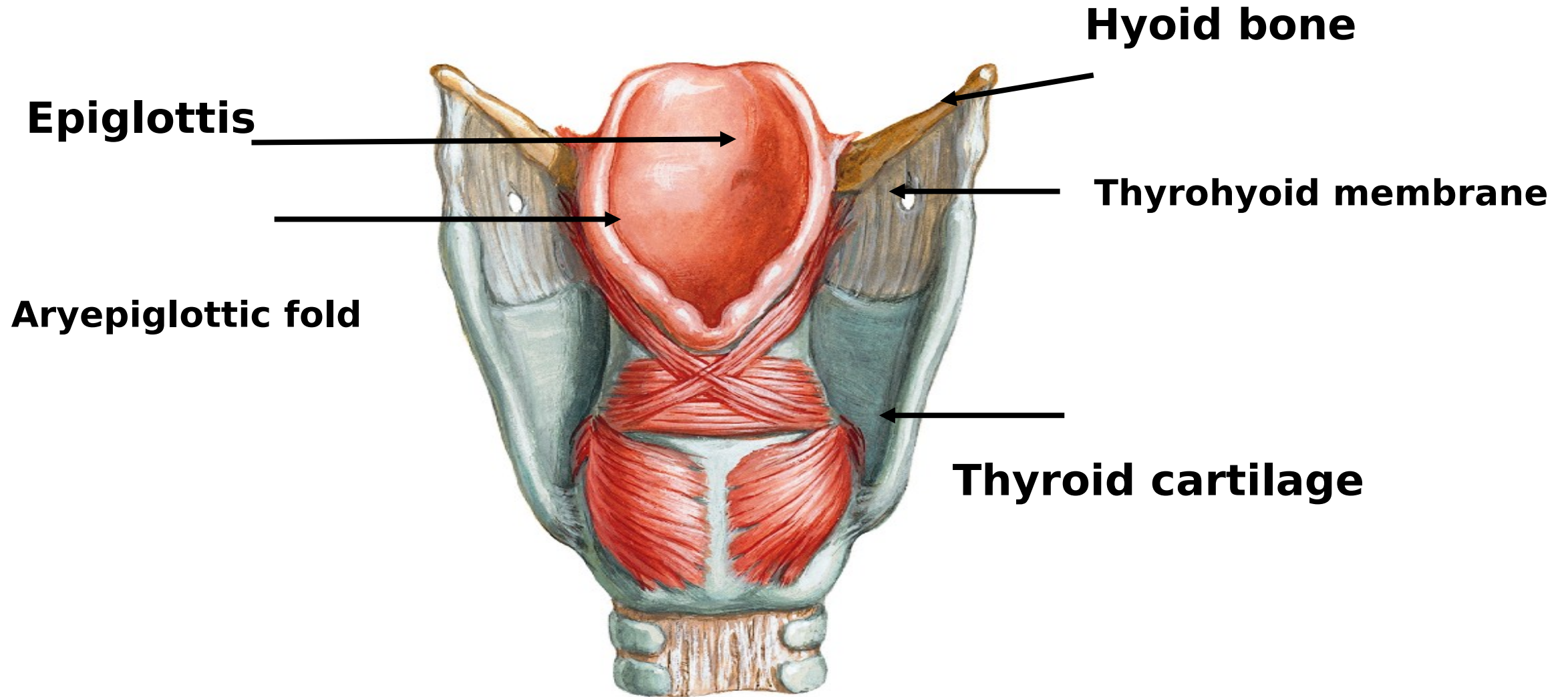
# laryngopharynx



**Epiglottis**

**Cricoid  
cartilage**

# laryngopharynx





Which nerve is related to pyriform fossa?

A-recurrent laryngeal

B- external laryngeal

C- internal laryngeal

D- vagus

E- accessory

# Muscles of pharynx



## Constrictors

- Superior constrictor
- Middle constrictor
- Inferior constrictor

## Longitudinal muscles

- Stylopharyngeus
- Platopharyngeus
- salpingiopharyngeus



# Constrictors of pharynx



## Superior constrictor

Ptergomandibular raphe , posterior end of mylohyoid line , pterygoid hamulus & medial pterygoid plate ( in same plane as buccinator)

## Middle constrictor

Greater and lesser horn of hyoid bone and stylohyoid ligament

## Inferior constrictor

**Thyropharyngeus** : oblique line of thyroid cartilage

**Cricopharyngeus** : side of cricoid cartilage

**Insertion** : by pharyngeal raphe into pharyngeal tubercle

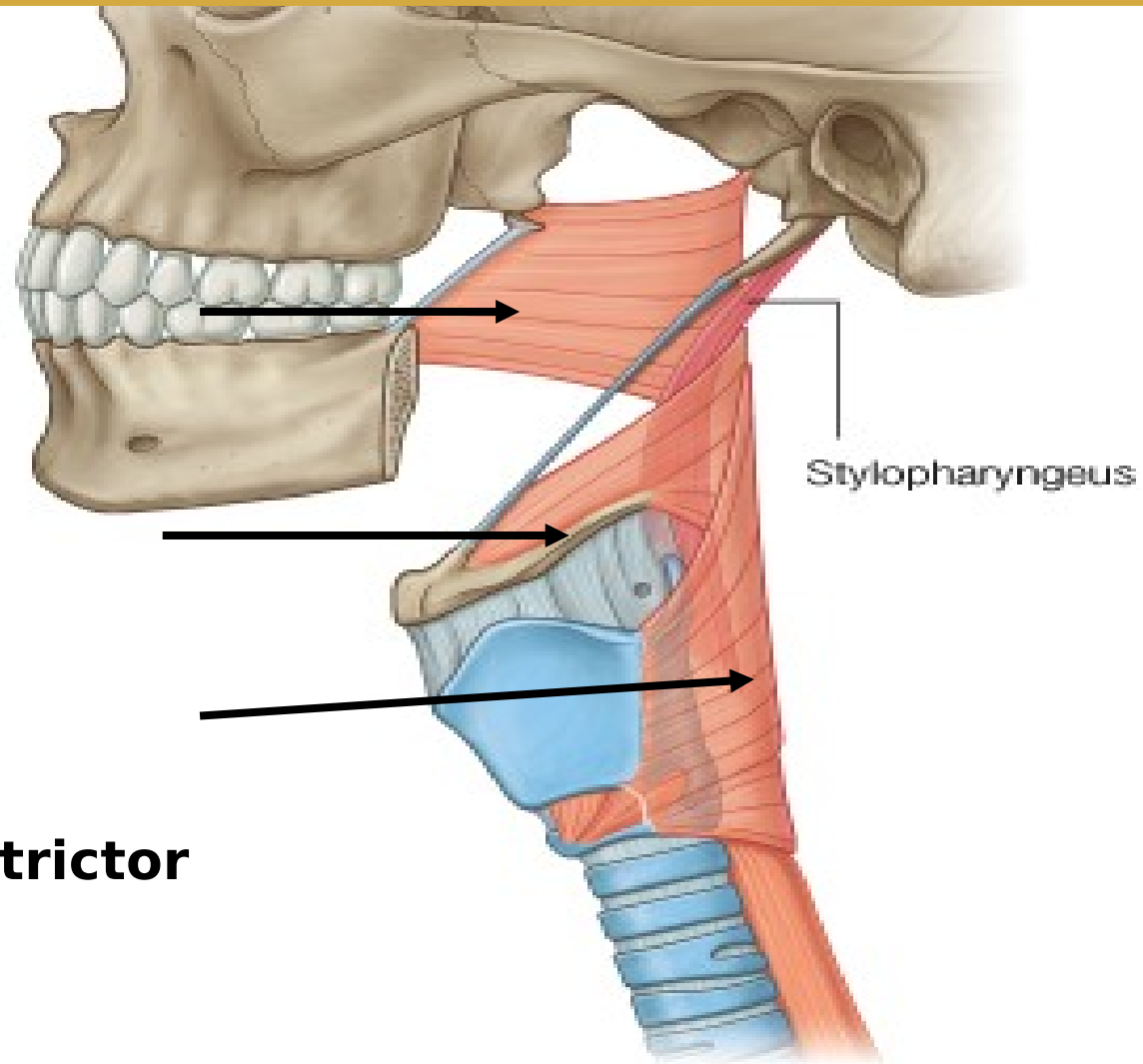
# Constrictors of pharynx



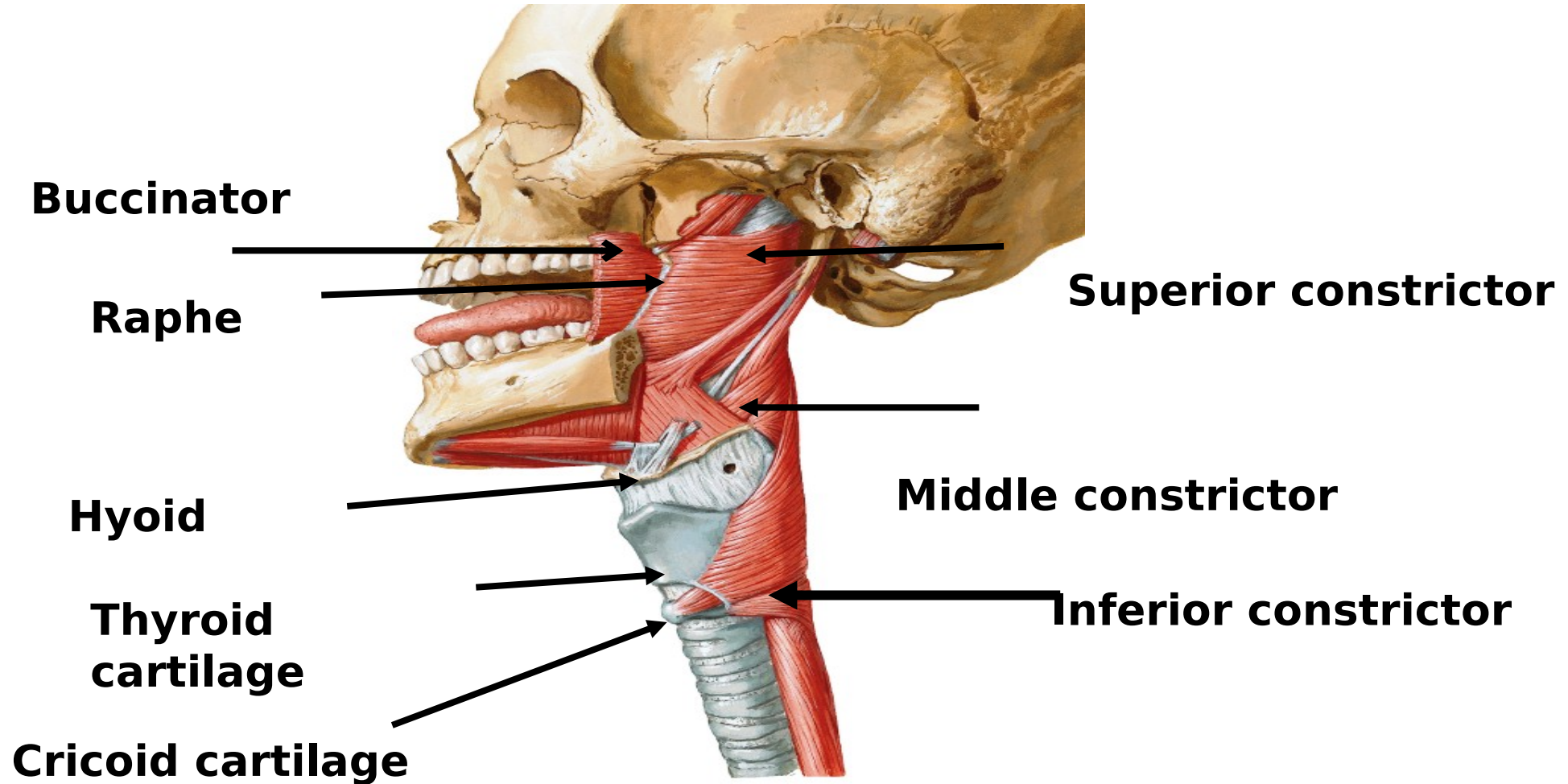
**Superior  
constrictor**

**Middle  
constrictor**

**Inferior constrictor**



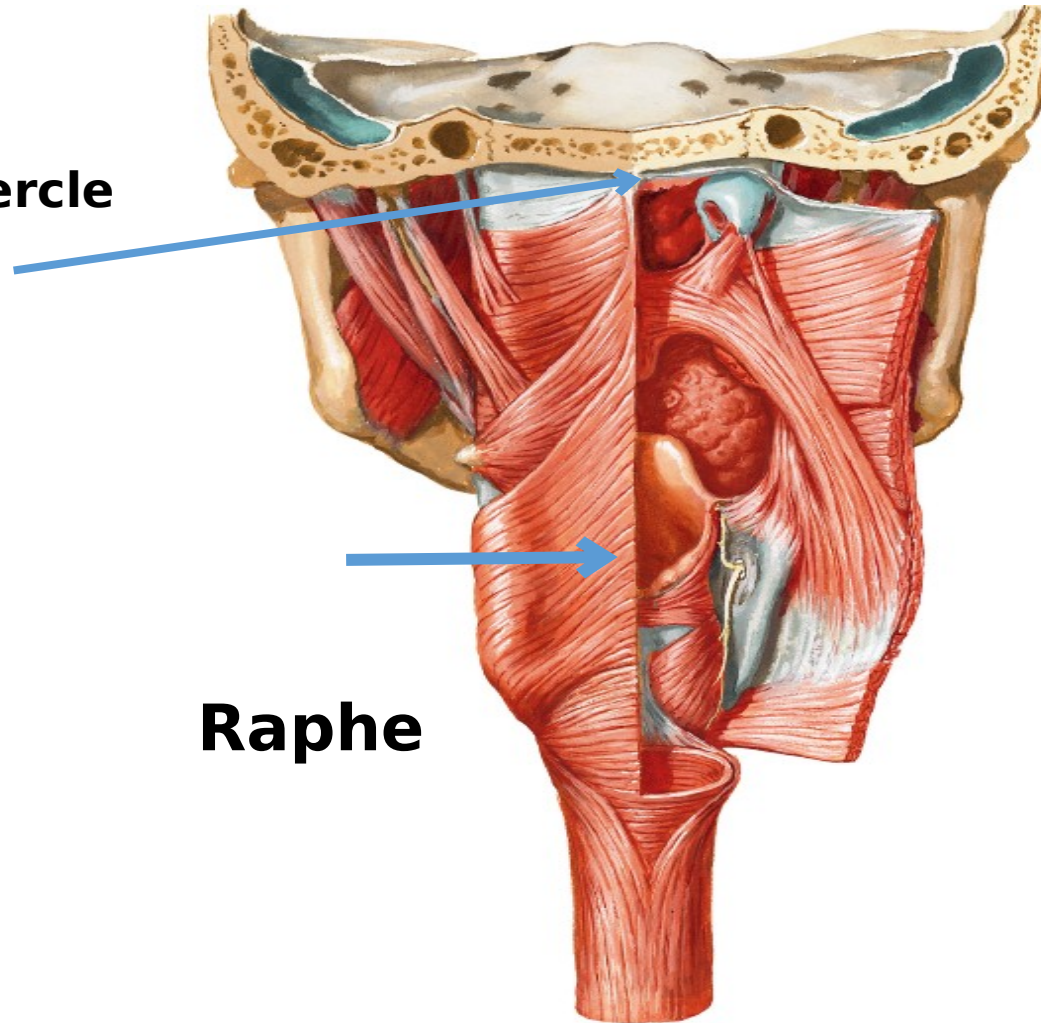
# Constrictors of pharynx



# Pharyngeal raphe



**Pharyngeal tubercle**



**Raphe**

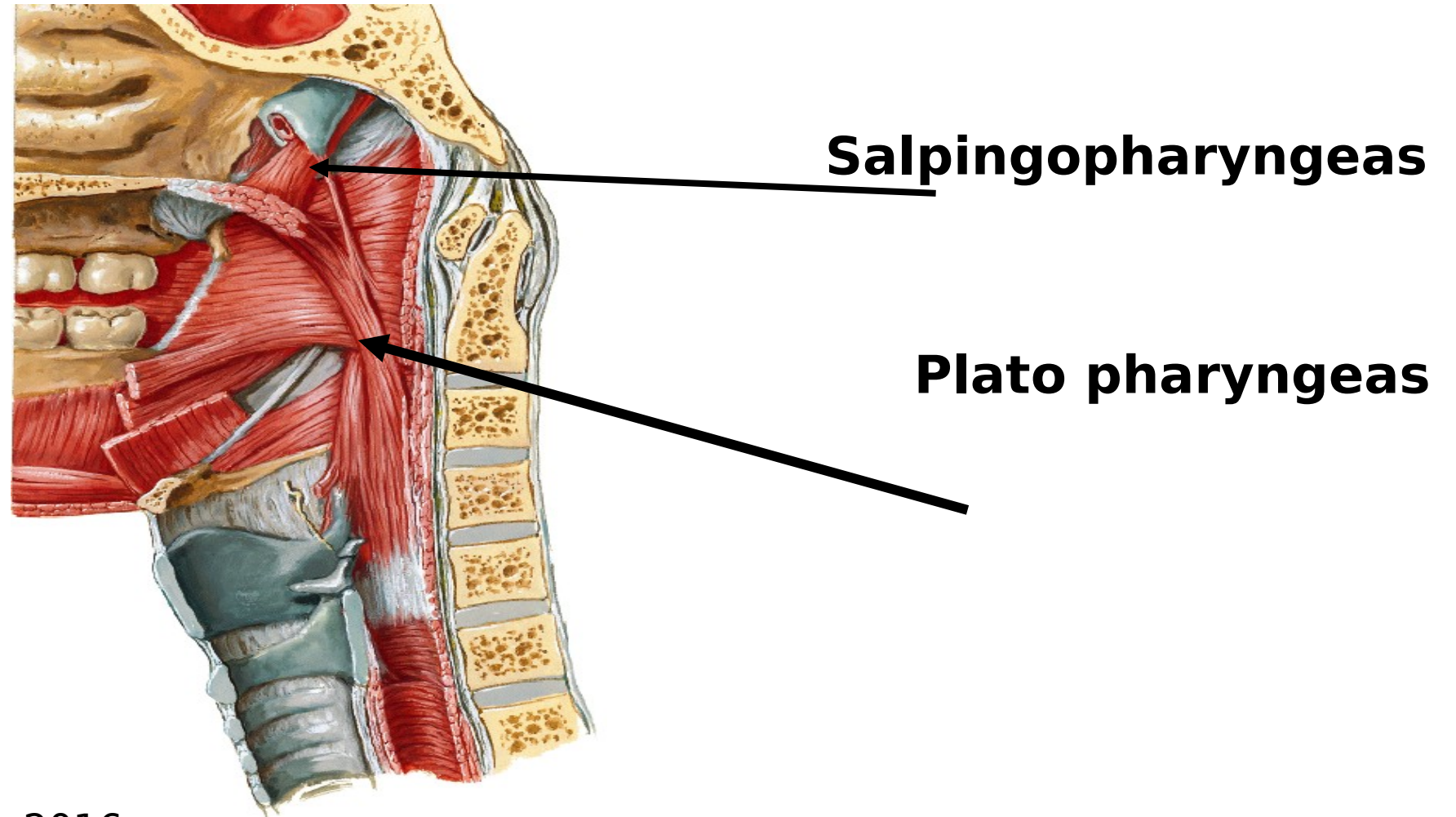
# Longitudinal muscles



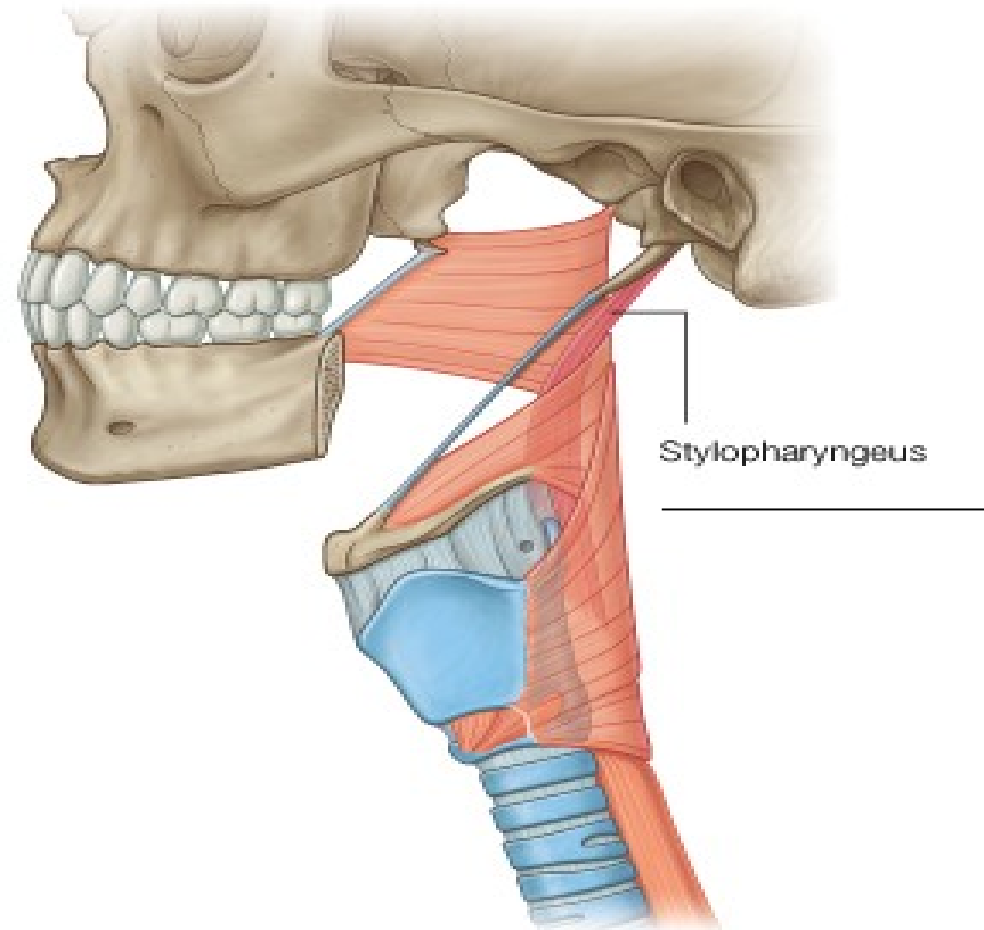
- ❑ **Stylopharyngeus:** from base of styloid process
  - ❑ **Salpingopharyngeus:** anterior end of cartilage of auditory tube
  - ❑ **Palatopharyngeus:** upper surface of palatine aponeurosis.
- Insertion:** in posterior border of thyroid cartilage



# Longitudinal muscles of pharynx



# Longitudinal muscles of pharynx



© Elsevier. Drake et al: Gray's Anatomy for Students - [www.studentconsult.com](http://www.studentconsult.com)

GIT module

# Longitudinal muscles of pharynx



Which nerve supplies stylopharyngeus ?

A- vagus

B- accessory

C- glossopharyngeal

D- facial

E- mandibular

# Action of Muscles of Pharynx



- ❑ **Superior , middle and thyropharyngeal** part of inferior constrictor **propel** food downwards during swallowing
- ❑ **Cricopharyngeal part of inferior constrictor** is a **sphincter** to lower end of pharynx preventing suction of air into esophagus .it relaxes in end of 2 stage of swallowing to allow food to pass to esophagus
- ❑ **3 longitudinal muscles** pull pharynx & larynx **upwards** in 2 stage to close

# Nerve supply of Pharynx



- ❑ All muscles of pharynx are supplied by **cranial accessory** joining vagus except

**Stylopharyngeus which is supplied by.....**

- ❑ **Pharyngeal Plexus**: lies on middle constrictor. it is formed by cranial accessory, branches of glossopharyngeal and sympathetic branches from superior cervical sympathetic ganglia
- ❑ **Sensory nerve supply**
  - **Nasopharynx**: Maxillary nerve(**5**)
  - **Oropharynx**: Glossopharyngeal(**9**)
  - **Laryngopharynx**: Vagus(**10**)

# Blood supply of pharynx



## Blood supply

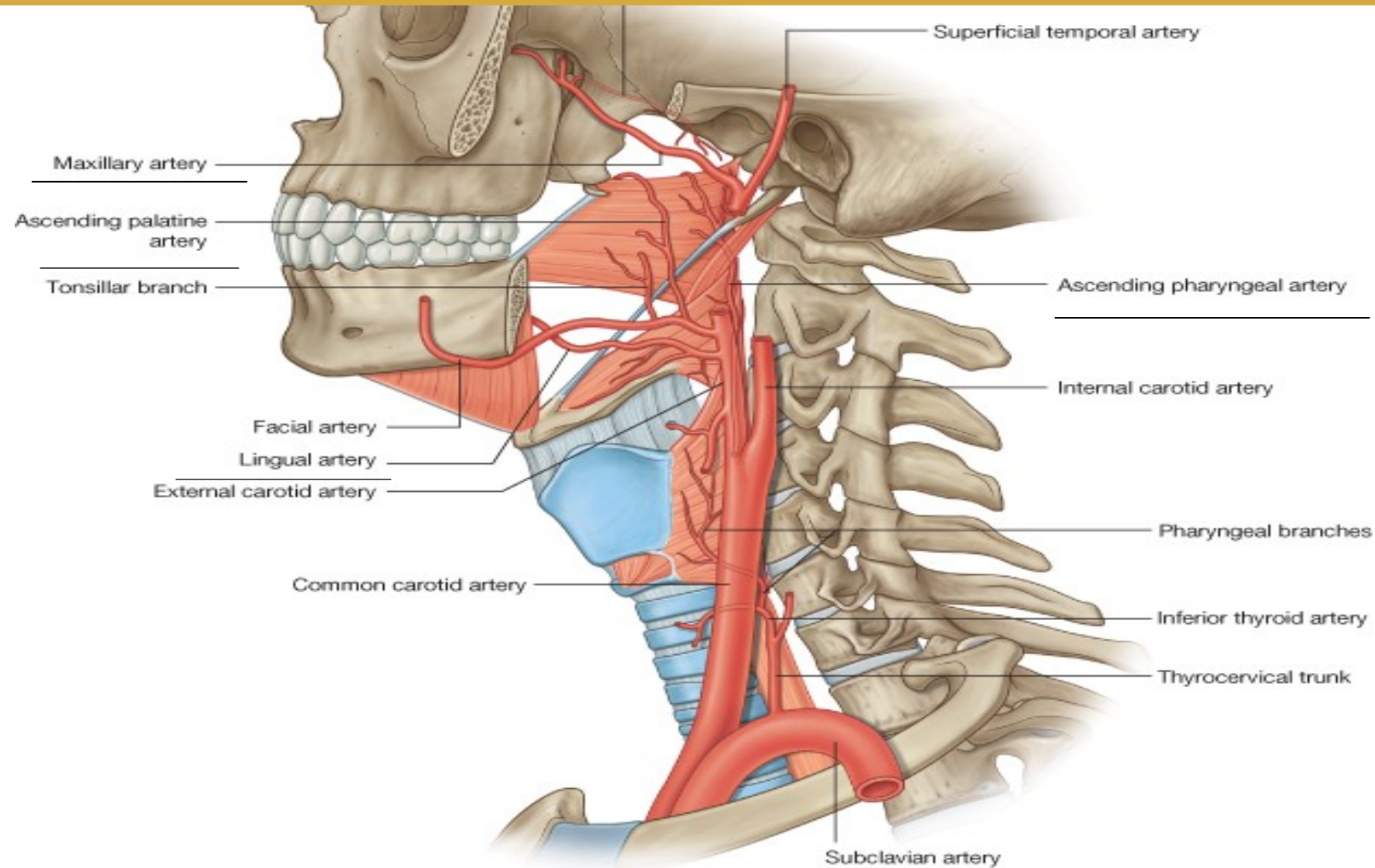
1. Ascending pharyngeal
2. Ascending palatine
3. Pharyngeal branch of maxillary
4. Dorsal lingual
5. Greater palatine
6. Tonsillar of facial
7. Superior & inferior laryngeal arteries

## Venous drainage :

pharyngeal plexus which ends  
in **Pterygoid venous plexus**



# Blood supply of pharynx



# Esophagus



- ❑ Direct continuation of pharynx
- ❑ Begins at cervical 6
- ❑ 25 cm in length
- ❑ It has course in neck, thorax  
( superior & posterior mediastinum)  
& abdomen
- ❑ Passes in diaphragm at level of T 10  
one inch to left of median plane to  
join stomach

## **Blood supply**

**Upper third** : inferior thyroid artery

**Middle third** ; descending thoracic  
aorta

**Lower third** : left gastric artery

**Venous drainage** : upper third in

# Esophagus

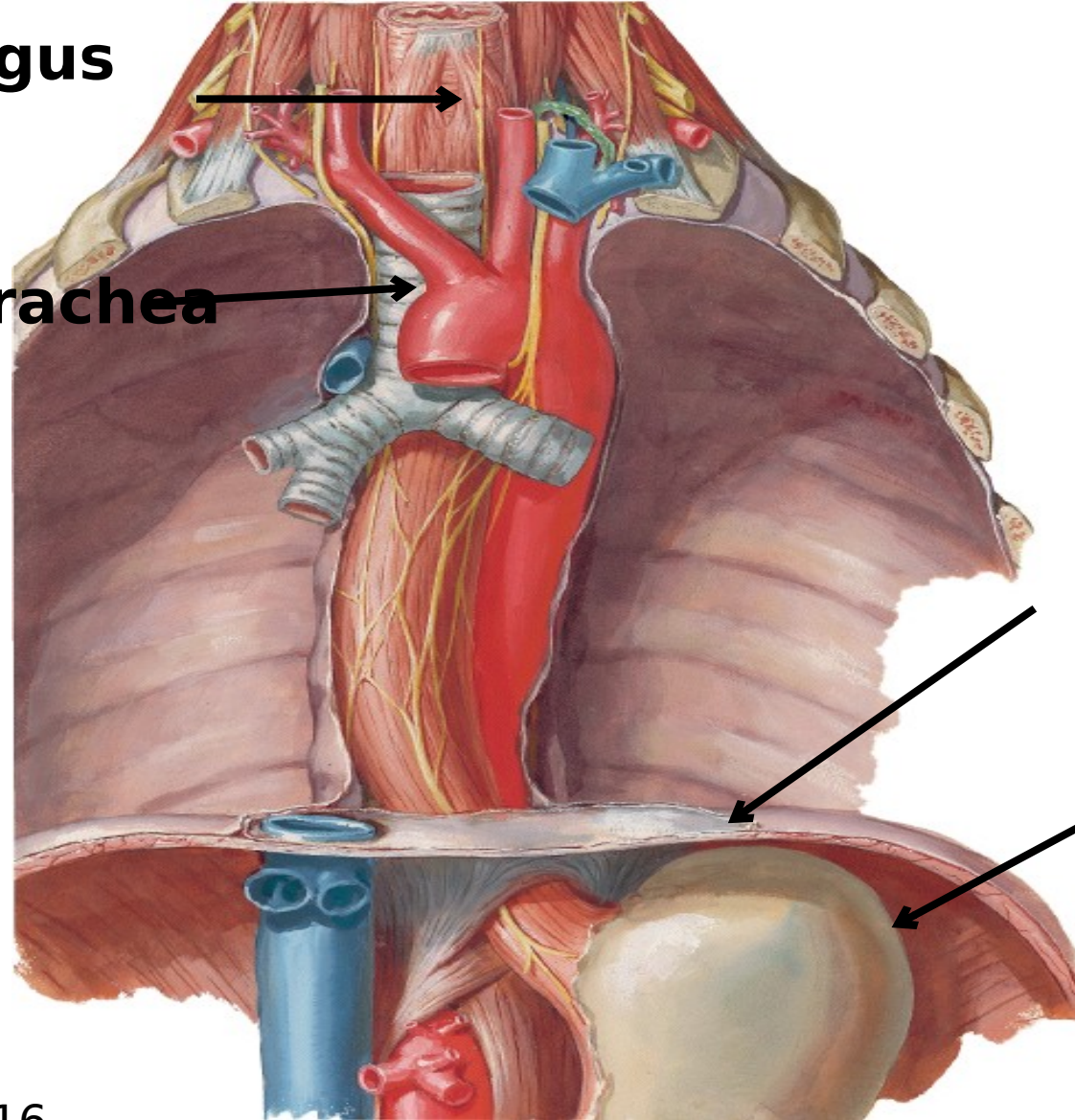


**esophagus**

**Trachea**

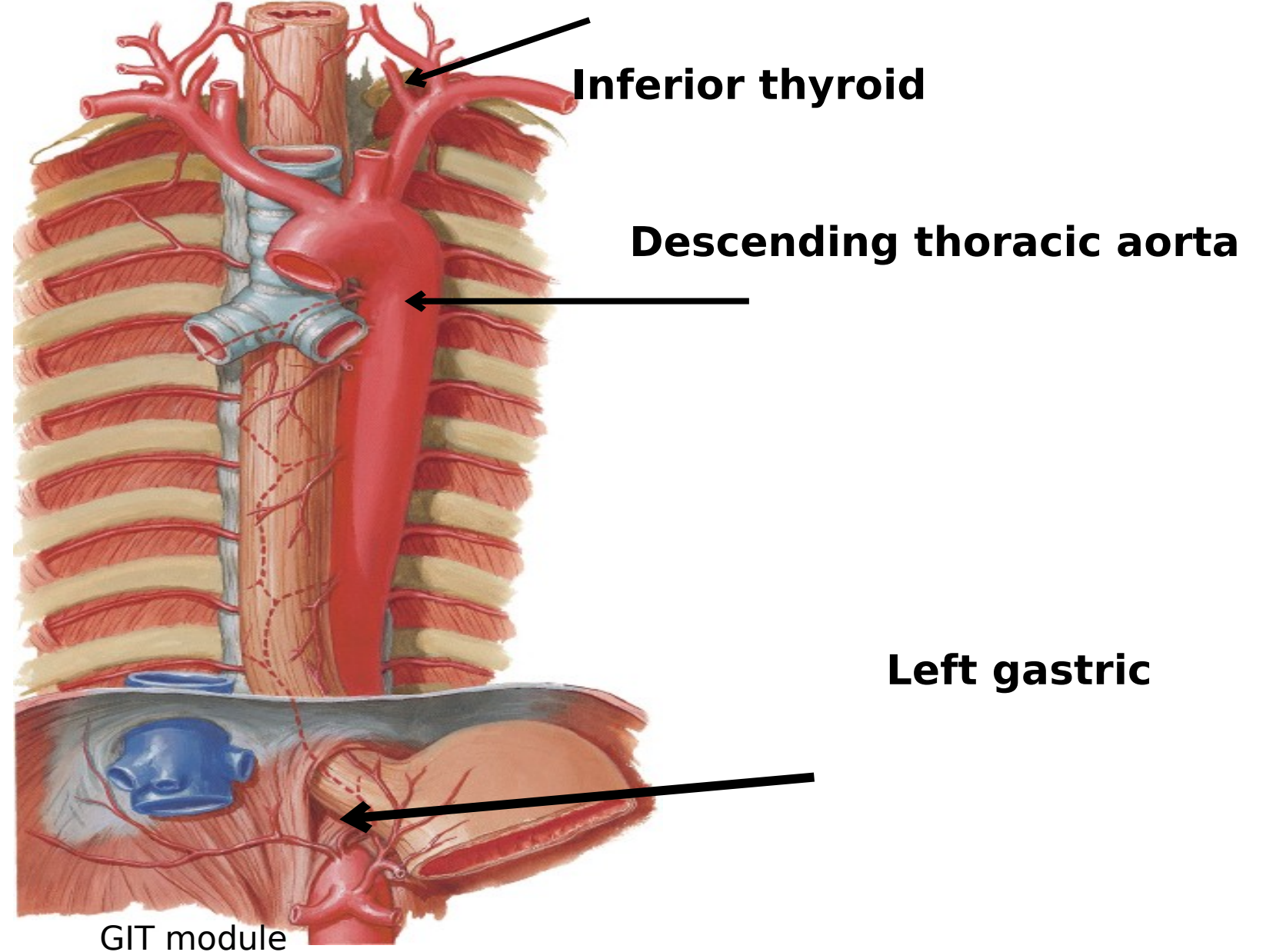
**Diaphragm**

**Stomach**





# Esophagus



# Constrictions of esophagus



Esophagus shows 3 **constrictions**

1- At junction with pharynx

2- Where aortic arch & left bronchus cross its anterior surface

3- When esophagus passes in diaphragm

**They are at 6,10, 16 inches from upper incisor respectively**

❖ They are sites of foreign body lodge

# Lecture Quiz



1. Enumerate the **blood supply of tonsils**
2. The junction between nasopharynx and oropharynx is called?
3. **A muscle that prevents entry of air into esophagus**
  - a) Thyropharyngeus
  - b) Cricopharyngeus
  - c) Styloppharyngeus
  - d) Platopharyngeus



## **SUGGESTED TEXTBOOKS**



### 1. Clinical Anatomy by regions by Richard Snell